

Data Evaluation Documentation and Findings

Parcel:	G	Unit:	ES115 (S0113)
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Section I: Reason For Evaluation (Summary of Flagged Data):									
1) K-S Test: Pass/Fail?									Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/>
Units Evaluation Flags									
Ac-228	Bi-212	Bi-214	Cs-137	K-40	Pb-212	Pb-214	Ra-226	Total	
			2					2	
Days Evaluation Flags									
Ac-228	Bi-212	Bi-214	Cs-137	K-40	Pb-212	Pb-214	Ra-226	Total	
								0	
2) Logic Tests: Pass/Fail?									Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/>
Logic Test 1: Were FSS samples collected on the same day? Observation: FSS samples 01 through 18 were collected on 07/09/2008.									Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Logic Test 2: Were FSS samples collected on the same day or after confirmatory/biased samples were collected? Observation: Bias samples 19 through 24 were collected on 07/09/2008 (during and just after FSS samples).									Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Logic Test 3: Were samples collected before they were counted? Observation:									Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Logic Test 4: Were all FSS samples analyzed within 2 working days? Observation: FSS samples were analyzed on 07/09/2008 and 07/10/2008.									Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Logic Test 5: Were samples counted within 2 weeks of sample collection? Observation: Samples 01, 03, and 09 counted zero (0) days after collection. Samples 02, 04 through 08, and 10 through 24 were counted 1 day after collection.									Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Logic Test 6: Is the mass of the sample reported by the onsite lab the same as the mass reported by the offsite lab? Observation: Offsite lab mass was not reported.									Yes <input type="checkbox"/> No <input type="checkbox"/>
3) Time Series Plots: Pass/Fail?									Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/>
Bi-214	Anomalies or unusual trends identified?								No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
	Notes:								
Ac-228	Anomalies or unusual trends identified?								No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
	Notes:								
K-40	Anomalies or unusual trends identified?								No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
	Notes:								
4) Historically Significant Site Location: Yes/No?									No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
Was a known radiation cleanup performed at (or near) this site? If yes, where?									No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
Is the sewer line connected to or downstream from a radiologically-impacted building? If yes, which building?									No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
5) Allegation: Yes/No?									No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

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If yes, description:		
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Section II: Evaluations Performed			
1) Other Statistics Results		Pass <input type="checkbox"/>	Fail <input checked="" type="checkbox"/>
Box Plots	Anomalies or unusual trends identified? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Notes: Two low outliers identified for Ac-228 Final Systematic samples. These outliers are not considered anomalous or unusual.		
Normal Quantile Plots	Anomalies or unusual trends identified? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Notes: Final Systematic samples display potential characteristics of at least two slightly different data populations for K-40.		
2) Additional Database Review Performed?		No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/>
Review objectives: 1. Investigate K-S Test results (2 flags for Cs-137 units). 2. Review and compare S0115 data with origination trench units' data (TU104, TU105, and TU113).			
Observations: 1. Cs-137 results for ES115 were generally higher than the average Parcel G results, but otherwise the data were within the expected range and were low compared to the removal action objective; The K-S flags do not implicate data falsification nor do they raise concerns regarding potential Cs-137 contamination. 2. S0115 Ac-228 and Bi-214 data compare very well with TU0105 and TU-0113 data; The average K-40 results for S0115 are slightly higher than TU105/TU113 data, but are within the range of variability. Overall, the data are viewed as consistent.			
3) Adjacent Survey/Trench Unit Review		Pass <input checked="" type="checkbox"/>	Fail <input type="checkbox"/>
List of Adjacent Units: TU105, TU110, TU111, TU112, and TU355.			
Was a review of adjacent unit's data performed? Yes.			
Anomalies or unusual trends identified?		No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>
Notes: The potential for two K-40 data populations appears reasonable when looking at the remediation action support data for TU105 (a source for ES115) and does not indicate data falsification.			
4) SUPR or FSSR Review Performed? – March 2011 Final SUPR			
Summary of Excavation / Sampling Activities	Survey Unit 113 is the sum of TU113, excavated soil from ES115, ES116 and a volume of import fill material; which was used for backfill. The gamma scan of ES115 identified several measurements above the investigation level. Therefore, six additional samples were collected. None of the sample results identified activity above the release criteria for any radionuclide of concern (ROC). Eighteen (18) systematic samples were collected from ES115. Samples 03 and 09 were randomly selected to be analyzed for Sr-90. None of the sample results identified activity above the release criteria for any ROC.		
Gamma Static Data Observations:	Not provided in the SUPR.		
Gamma Scan Data Observations:	Six bias samples were collected from an apparently geographically-located area where 20 gamma scan measurements were above the 3-sigma investigation level of 3,020 cpm (total gamma). The maximum result was 3,497 cpm and is documented as being sampled. All six bias samples were included in the report and none exceeded cleanup criteria.		

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List of Excavation / Overburden Units Used for Backfill		ES115 and ES116 were used to backfill TU113	
Onsite / Offsite Lab Data Comparison:		Two samples (Samples 04 and 09) were sent offsite for analysis. The Ac-228 and Bi-214 results were comparable; the onsite K-40 results were higher than offsite results. Sample 04 fails for RER (1.4) and RPD (48%).	
Scan / Static Surveyor Name:		Not provided in the SUPR.	
Sampler / Surveyor Name:		Not provided in the SUPR.	
5) RACR or CSR Review Performed? – December 2011 Final Parcel G RACR			
List of Excavation / Overburden Units Created from Excavation:		ES115: TU104 (4%), TU105 (76%), TU113 (20%)	

Section III: Conclusions and Recommendations			
<p>Summary of Findings: Based on the findings of this evaluation, evidence of potential data falsification was found. The SUPR reported elevated gamma scan measurements and the collection of biased samples; however, no remediation was performed. This narrative is consistent with the allegation that biased samples were collected in areas to avoid potentially elevated sample results.</p>			
<input type="checkbox"/> No Further Action	<input type="checkbox"/> Reanalyze Archived Samples	<input checked="" type="checkbox"/> Confirmation Sampling	<input type="checkbox"/> Physical Inspection of Archived Samples
<input type="checkbox"/> Other Recommendations:			
Additional Information Required: None.			

Completed by: Scott Walnicki

Date: 07/27/2017

Reviewed by: Alejandro Lopez, CHP

Date: 09/07/2017

Approved by: Matt Liscio

Date: 09/08/2017

Acronyms:

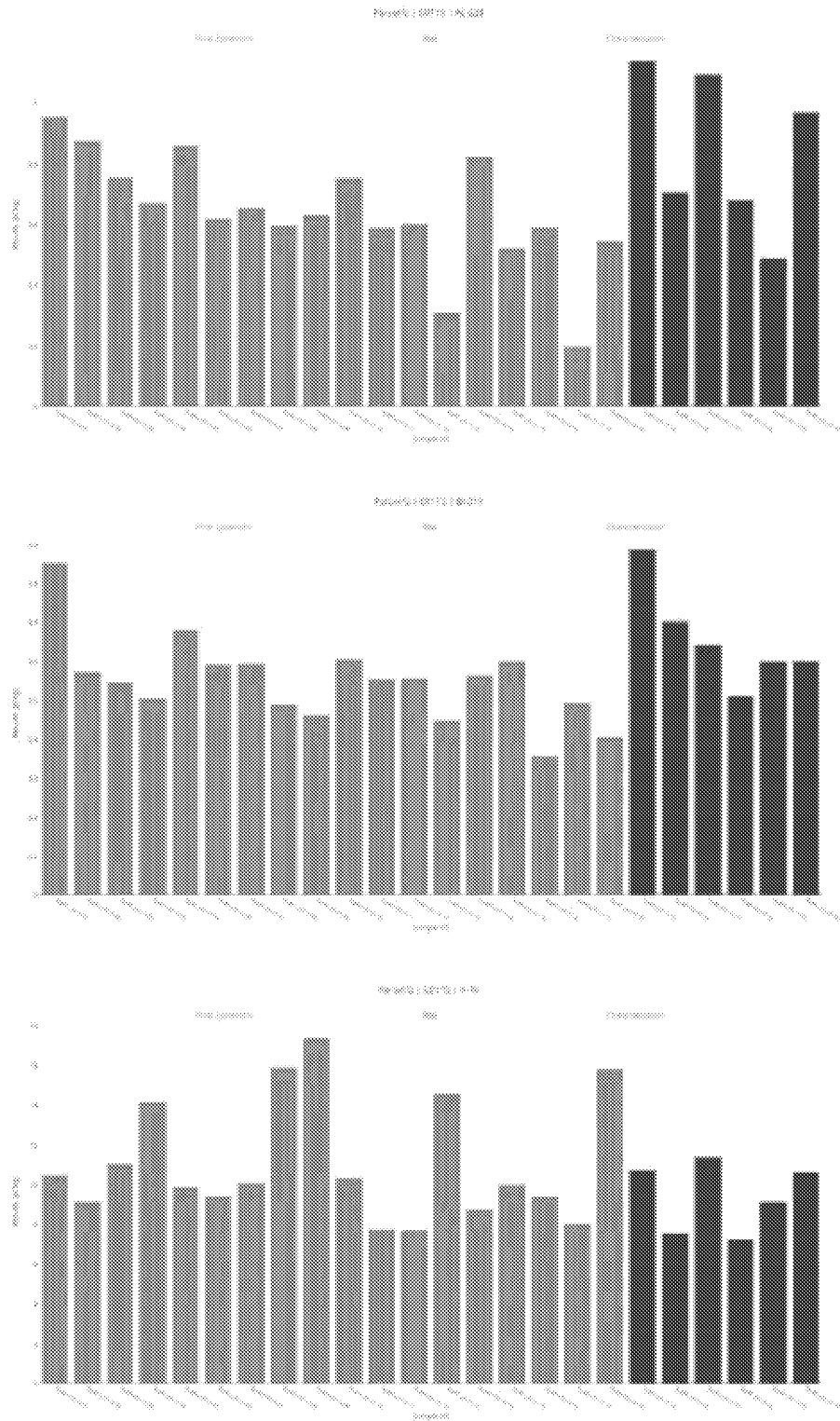
Ac Actinium (e.g., Ac-228)
 B Former Building (or other site) Surface Soil Survey Unit
 Bi Bismuth (e.g., Bi-214)
 Cs Cesium (e.g., Cs-137)
 CSR Construction Summary Report
 COC Chain of Custody
 ESU Excavation Survey Unit
 FSS Final Status Survey
 FSSR Final Status Survey Report

K Potassium (e.g., K-40)
 OB Overburden Unit
 Pb Lead (e.g., Pb-212)
 pCi/g picocuries per gram
 Ra Radium (e.g., Ra-226)
 RACR Remedial Action Completion Report
 ROC radionuclide of concern
 S Sewer or Storm Drain Removal Survey Unit
 SUPR Survey Unit Progress Report
 TU Trench Unit

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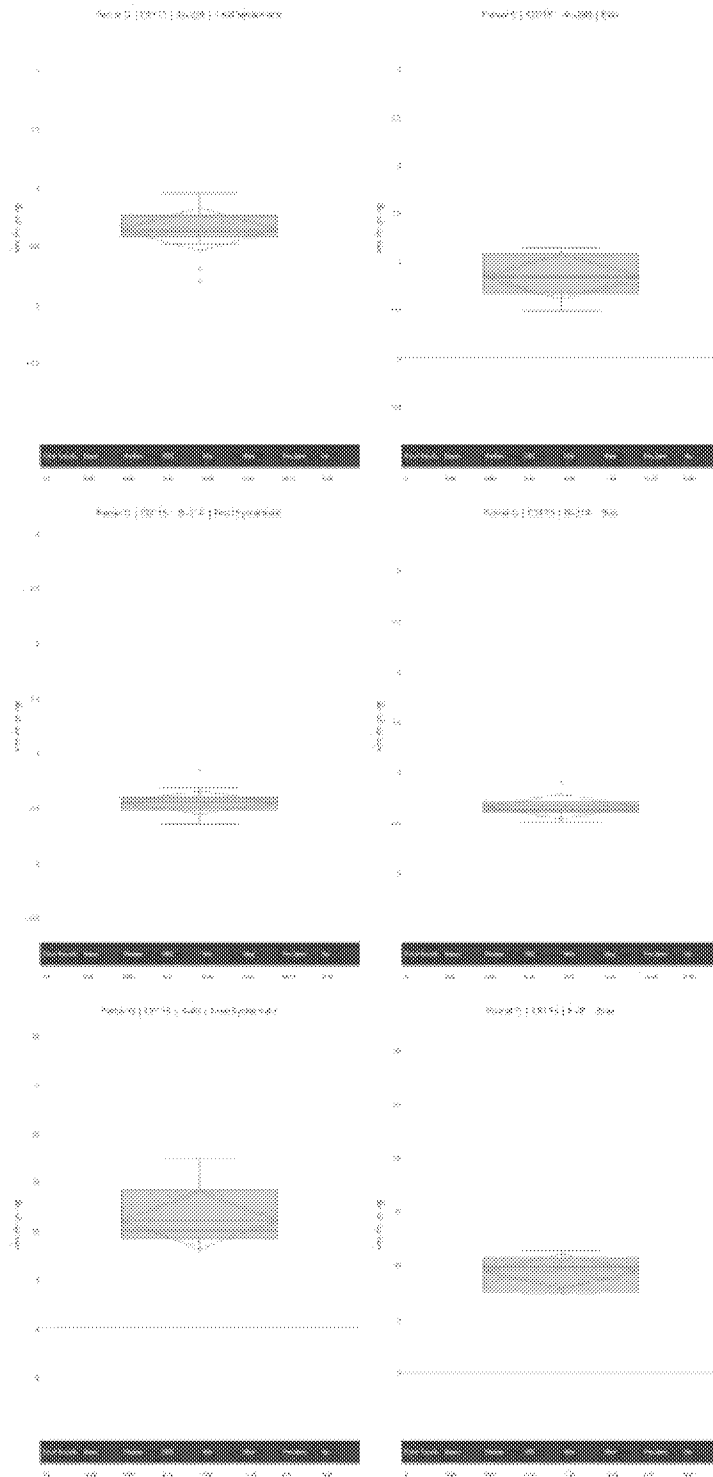
Time-Series Plots



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Box Plots

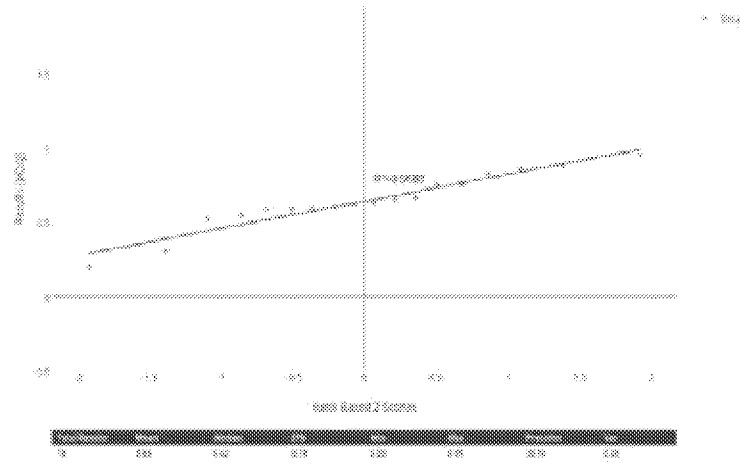


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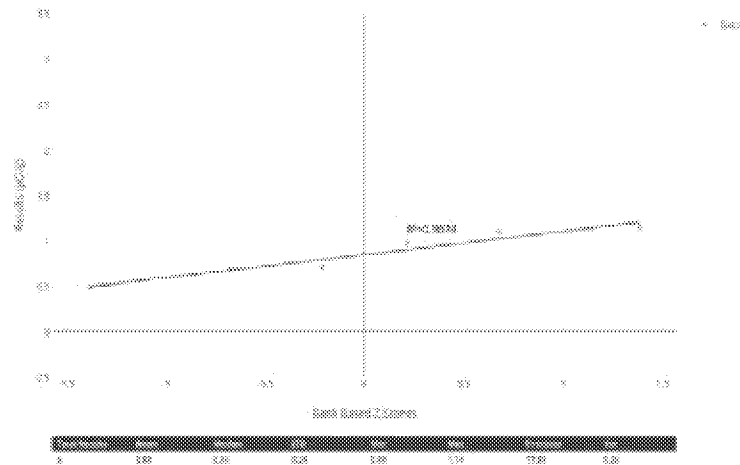
Parcel:	G	Unit:	ES115 (S0113)
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Normal Quantile Plots

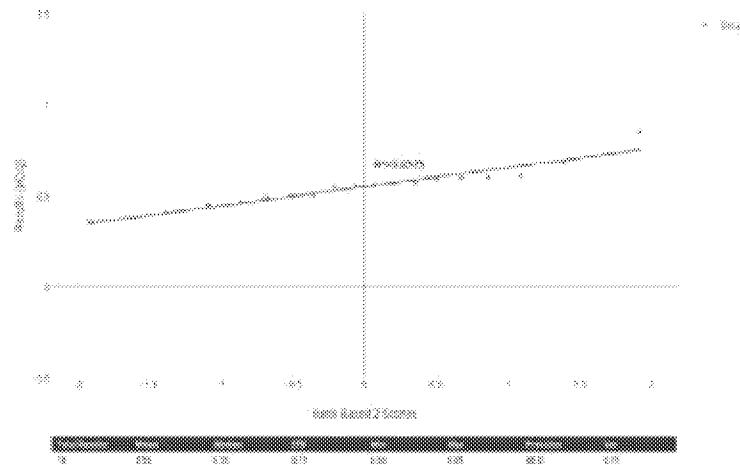
Parcel G | 07115 | A-228 | Retail Systematic



Parcel G | 10115 | A-228 | Retail

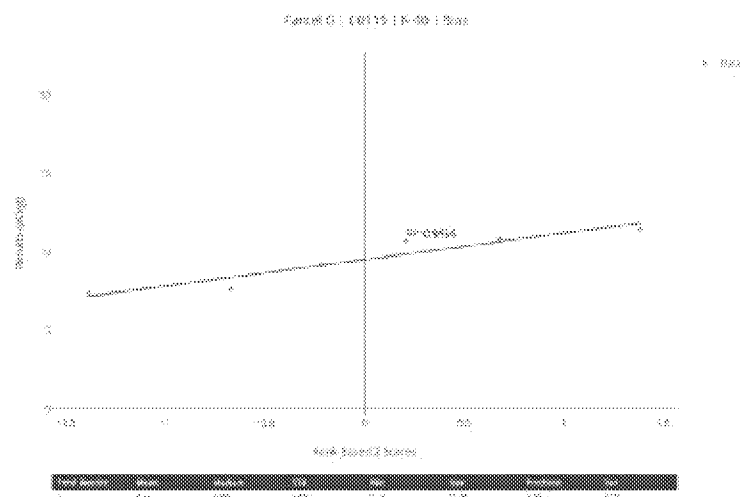
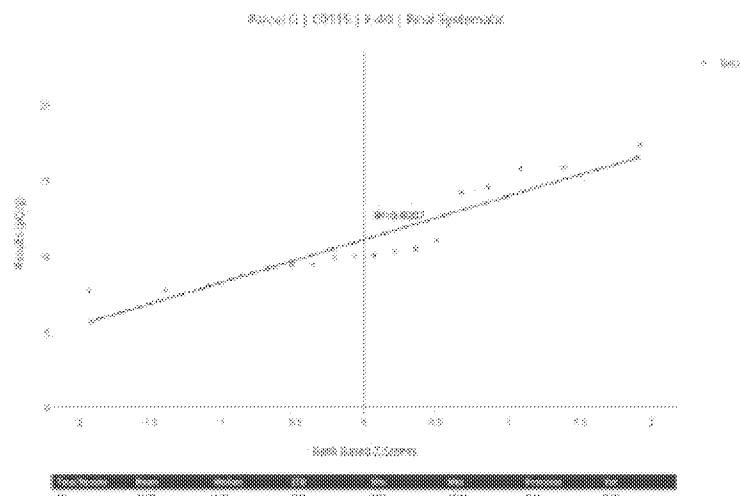
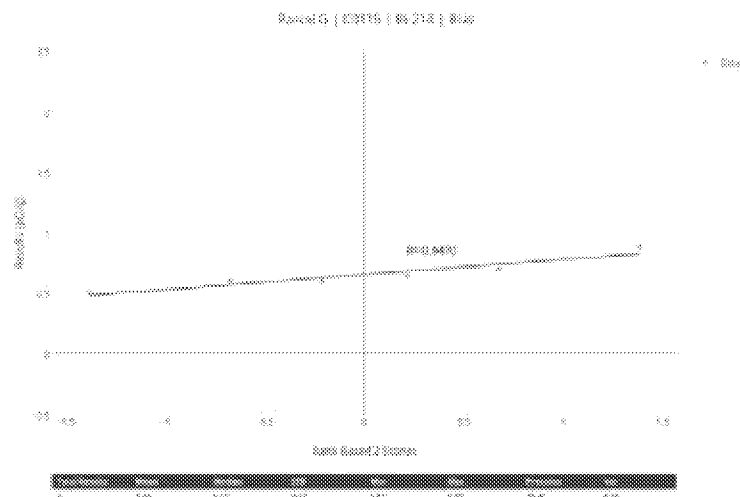


Parcel G | 05115 | B-274 | Retail Systematic



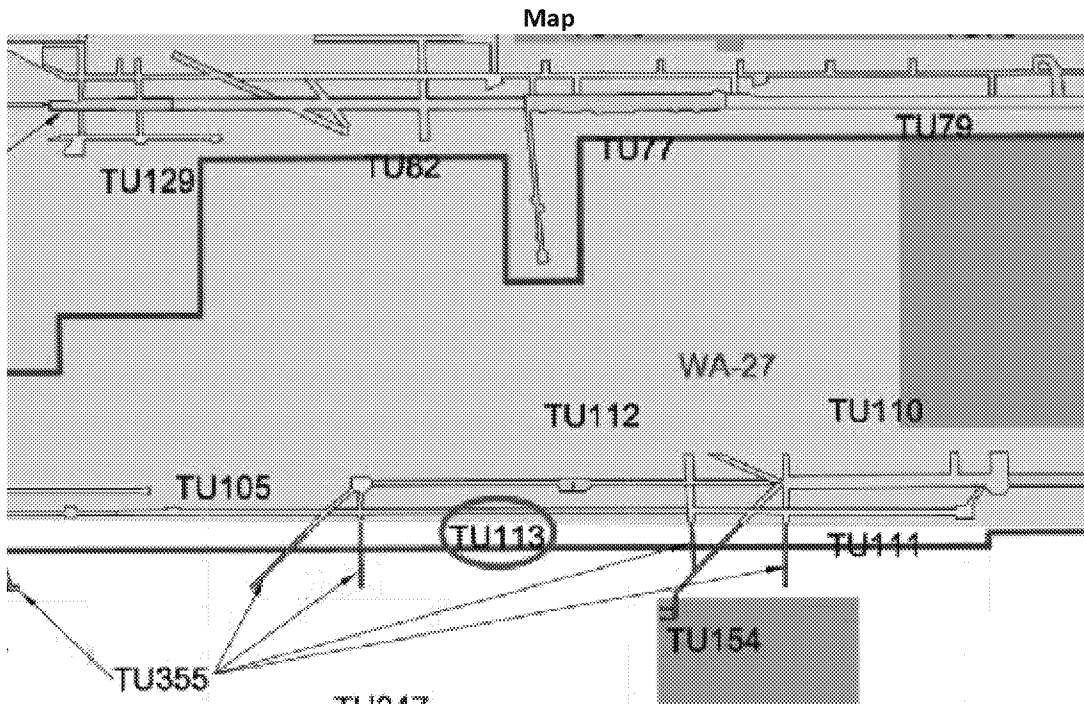
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Data Evaluation Documentation and Findings

Parcel:	G	Unit:	TU116 (S0116)
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Section I: Reason For Evaluation (Summary of Flagged Data):										
1) K-S Test: Pass/Fail?									Pass <input checked="" type="checkbox"/>	Fail <input type="checkbox"/>
Units Evaluation Flags										
Ac-228	Bi-212	Bi-214	Cs-137	K-40	Pb-212	Pb-214	Ra-226	Total		
								0		
Days Evaluation Flags										
Ac-228	Bi-212	Bi-214	Cs-137	K-40	Pb-212	Pb-214	Ra-226	Total		
								0		
2) Logic Tests: Pass/Fail?									Pass <input checked="" type="checkbox"/>	Fail <input type="checkbox"/>
Logic Test 1: Were FSS samples collected on the same day? Observation: FSS samples were collected on 04/27/2009.									Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Logic Test 2: Were FSS samples collected on the same day or after confirmatory/biased samples were collected? Observation: Confirmatory/biased samples were collected on 10/28/2008 through 04/15/2009.									Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Logic Test 3: Were samples collected before they were counted? Observation:									Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Logic Test 4: Were all FSS samples analyzed within 2 working days? Observation: Samples were counted on 04/27/2009 and 04/28/2009.									Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Logic Test 5: Were samples counted within 2 weeks of sample collection? Observation: Samples were counted within 2 days of collection.									Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Logic Test 6: Is the mass of the sample reported by the onsite lab the same as the mass reported by the offsite lab? Observation: Offsite lab mass was not provided.									Yes <input type="checkbox"/>	No <input type="checkbox"/>
3) Time Series Plots: Pass/Fail?									Pass <input type="checkbox"/>	Fail <input checked="" type="checkbox"/>
Bi-214	Anomalies or unusual trends identified?								No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>
	Notes:									
Ac-228	Anomalies or unusual trends identified?								No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/>
	Notes: Two Bias and one Final Systematic samples have results below zero (0).									
K-40	Anomalies or unusual trends identified?								No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>
	Notes:									
4) Historically Significant Site Location: Yes/No?									No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/>
Was a known radiation cleanup performed at (or near) this site? If yes, where?									No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>
Is the sewer line connected to or downstream from a radiologically-impacted building? If yes, which building? Building 408. Building 408 houses a furnace/smelter that was constructed in 1947.									No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/>
5) Allegation: Yes/No?									No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/>
If yes, description:										

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Section II: Evaluations Performed			
1) Other Statistics Results			Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/>
Box Plots	Anomalies or unusual trends identified?		No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
	Notes:		
Normal Quantile Plots	Anomalies or unusual trends identified?		No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
	Notes:		
2) Additional Database Review Performed?			No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
Review objectives:			
Observations:			
3) Adjacent Survey/Trench Unit Review			Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/>
List of Adjacent Units: TU106			
Was a review of adjacent unit's data performed? Yes			
Anomalies or unusual trends identified?			No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
Notes: Sample results are similar to TU106.			
4) SUPR or FSSR Review Performed? – March 2011 Final SUPR			
Summary of Excavation / Sampling Activities	<p>No measurements above the investigation level were identified during the performance of gamma scans in Trench Unit 116.</p> <p>Samples 1-18: Three of the sample results identified Ra-226 activity to be present from 1.5615 to 2.8485 pCi/g.</p> <p>Samples 19-47: Based on this information, 29 additional samples were collected to further characterize the trench. Characterization sampling identified six additional locations where Ra-226 activity was present above the release criteria at levels up to 4.0260 pCi/g. Approximately 55 cubic yards of soil was remediated from the areas identified as having contamination present that exceeded the release criteria for Ra-226.</p> <p>Samples 48-59: Twelve post remediation samples were collected. Two of the post remediation sample results identified Ra-226 activity to still be present at levels up to 4.1986 pCi/g.</p> <p>Samples 60-62: An additional 6.75 cubic yards of soil was remediated from the areas identified as having contamination present that exceeded the release criteria for Ra-226, and three post remediation samples were collected. Post remediation sample results indicated that all contamination had been removed and no activity above the release criteria for any radionuclide of concern (ROC) was present.</p> <p>Samples 63 – 80: None of the sample results identified activity above the release criteria for any ROC.</p>		
Gamma Static Data Observations:	No date or time recorded for static survey in SUPR. Static measurements were on the lower end of the scan measurements.		
Gamma Scan Data Observations:	Scan survey performed on 04/27/2009 at 08:45 prior to the commencement of Final Systematic sampling. Some scan measurements exceeded the scan threshold.		
List of Excavation / Overburden Units Used for Backfill	Imported fill.		
Onsite / Offsite Lab Data Comparison:	The on-site laboratory reported Ra-226 activity above the minimum detectable activity for five of the six samples, while the off-site laboratory reported Ra-226 activity above the MDL for all six samples. As a result, the Ra-226 activities for five samples were compared directly for precision. The results of the comparison showed relative percent differences (RPDs) from 41.45 to 112.07. Since the on-		

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		site laboratory reported higher Ra-226 activity than the off-site laboratory and the RPDs were not within 30, as stated in the Sampling and Analysis Plan (TtEC 2010a), no additional comparison was required.	
Scan / Static Surveyor Name:	C. Hughes		
Sampler / Surveyor Name:	Not Provided in the SUPR		
5) RACR or CSR Review Performed? – December 2011 Final Parcel G RACR			
List of Excavation / Overburden Units Created from Excavation:	ES161 and ES163		

Section III: Conclusions and Recommendations			
Summary of Findings: Based on the findings of this evaluation, no evidence of potential data falsification was found. No reasonable potential for contamination based on a review of the Historical Radiological Assessment.			
<input checked="" type="checkbox"/> No Further Action	<input type="checkbox"/> Reanalyze Archived Samples	<input type="checkbox"/> Confirmation Sampling	<input type="checkbox"/> Physical Inspection of Archived Samples
<input type="checkbox"/> Other Recommendations:			
Additional Information Required: None.			

Completed by: Jason Hubler

Date: 08/18/2017

Reviewed by: Alejandro Lopez, CHP

Date: 08/24/2017

Approved by: Matt Liscio

Date: 09/11/2017

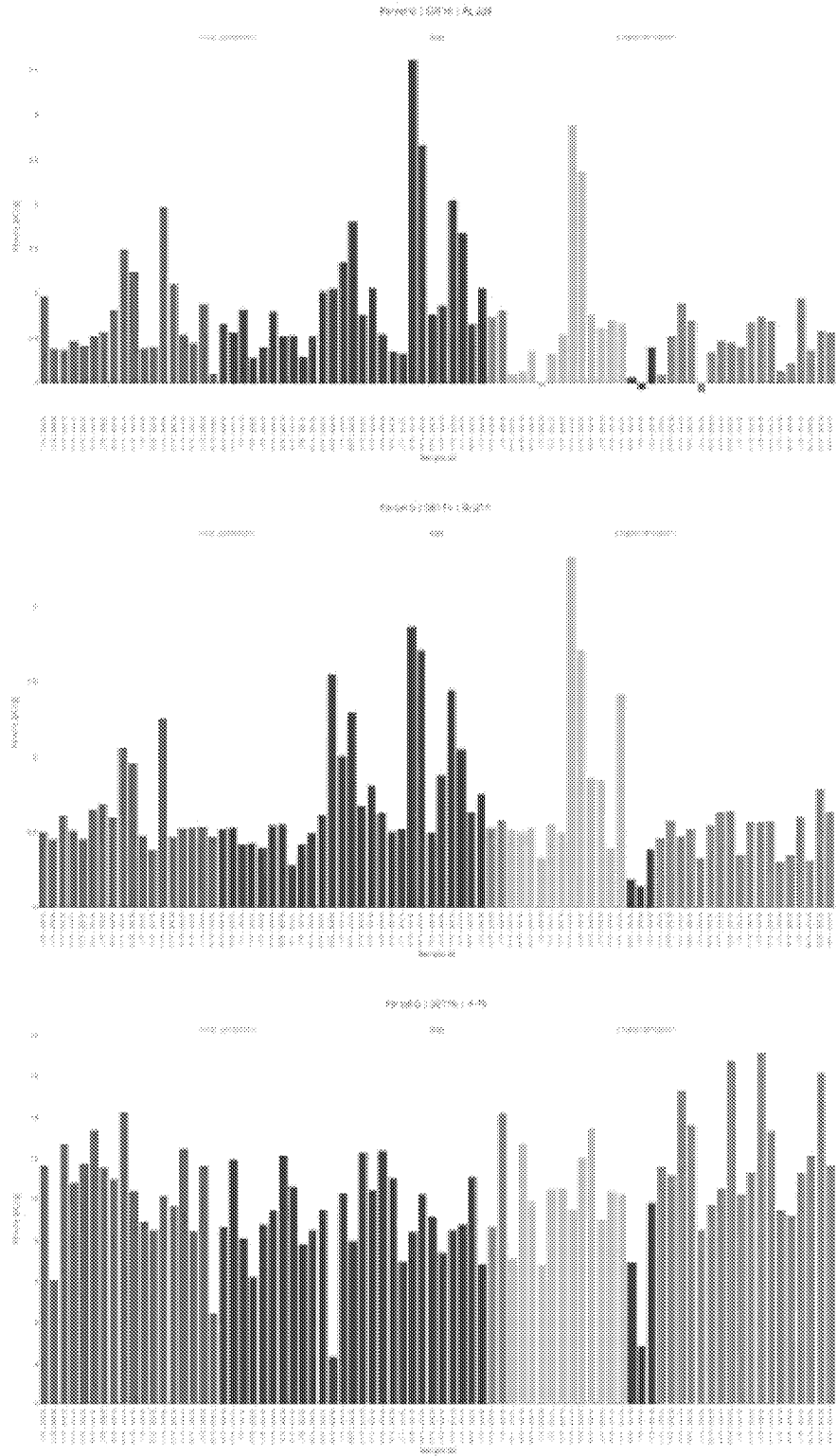
Acronyms:

Ac	Actinium (e.g., Ac-228)
B	Former Building (or other site) Surface Soil Survey Unit
Bi	Bismuth (e.g., Bi-214)
Cs	Cesium (e.g., Cs-137)
CSR	Construction Summary Report
COC	Chain of Custody
ESU	Excavation Survey Unit
FSS	Final Status Survey
FSSR	Final Status Survey Report
K	Potassium (e.g., K-40)
OB	Overburden Unit
Pb	Lead (e.g., Pb-212)
pCi/g	picocuries per gram
Ra	Radium (e.g., Ra-226)
RACR	Remedial Action Completion Report
ROC	radionuclide of concern
RPD	relative percent difference
S	Sewer or Storm Drain Removal Survey Unit
SUPR	Survey Unit Progress Report
TU	Trench Unit

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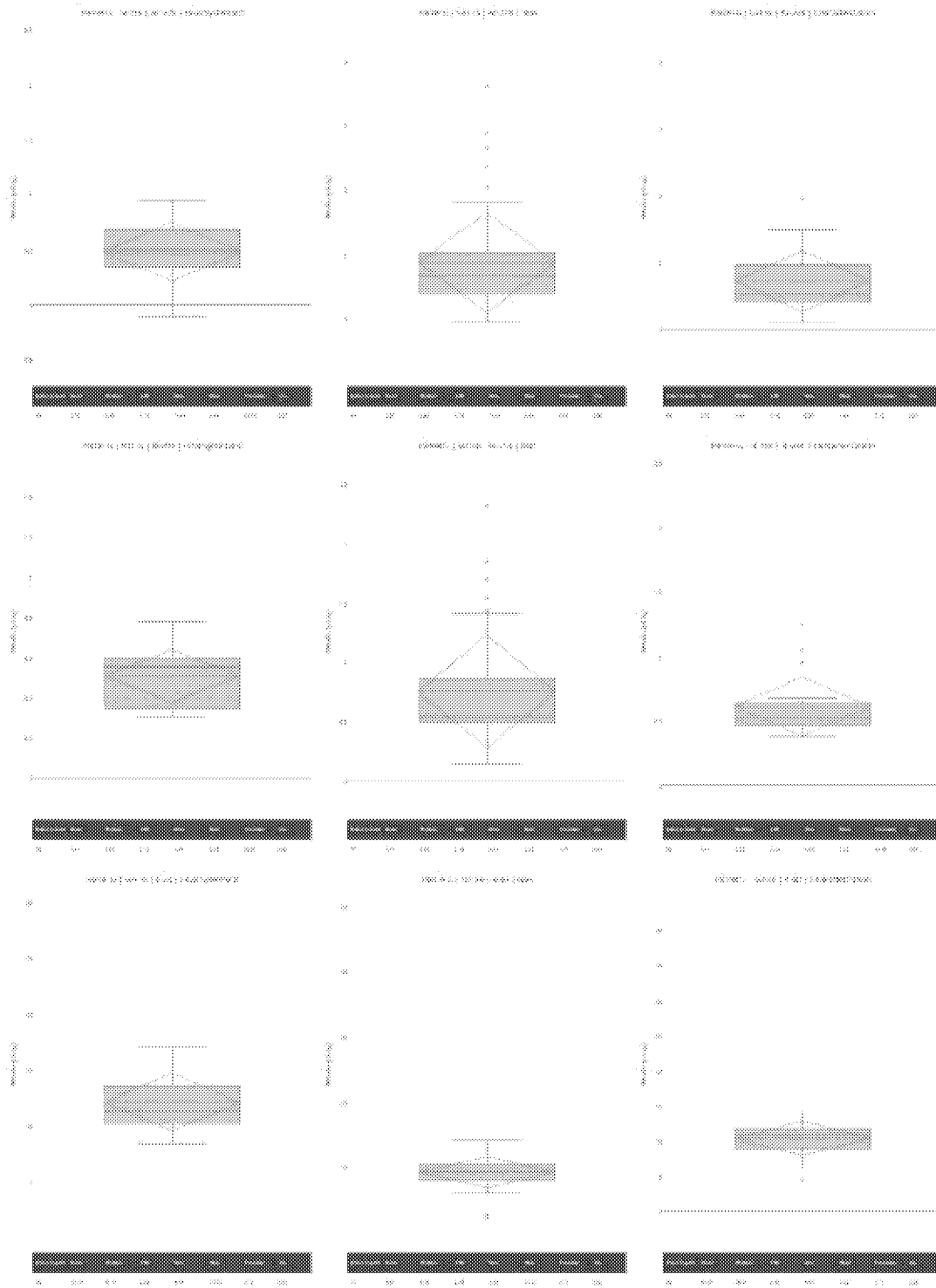
Time-Series Plots



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Box Plots

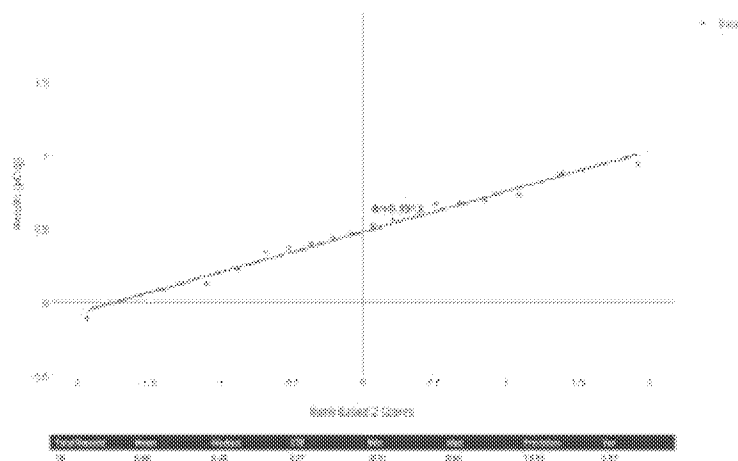


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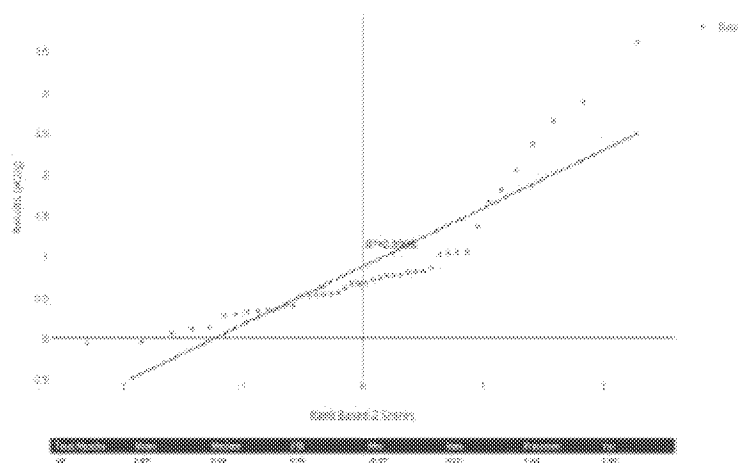
Parcel:	G	Unit:	TU116 (S0116)
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Normal Quantile Plots

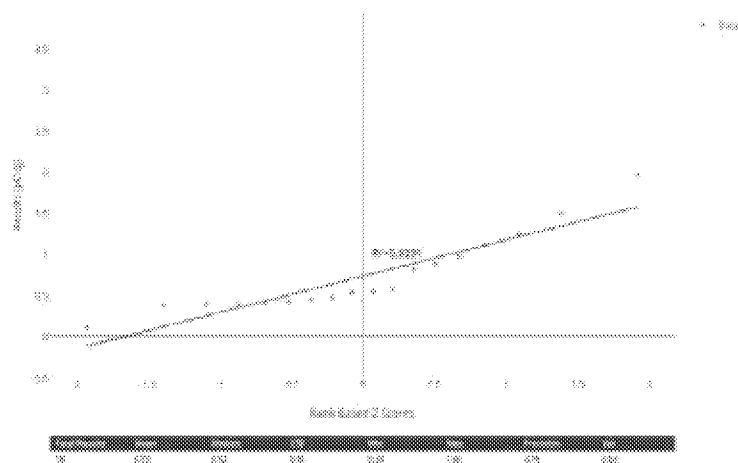
Parcel G | S0116 | Ac-228 | Road System/Dr.



Parcel G | S0116 | Ac-228 | Blue

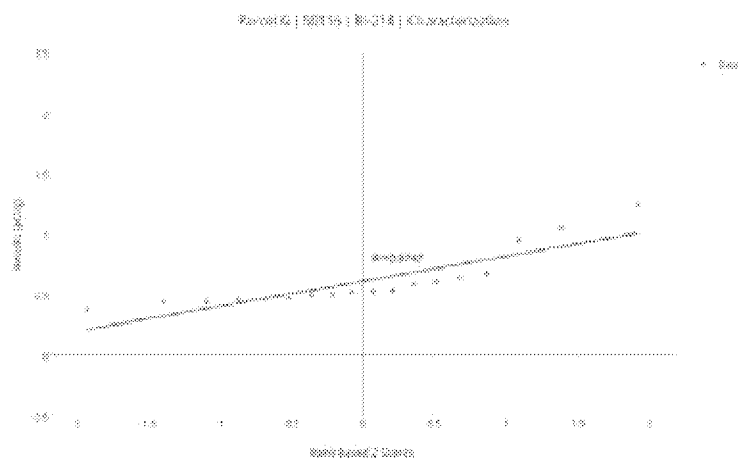
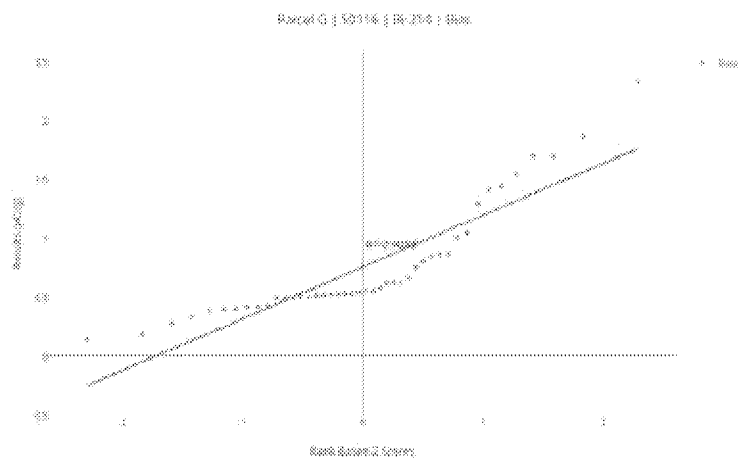
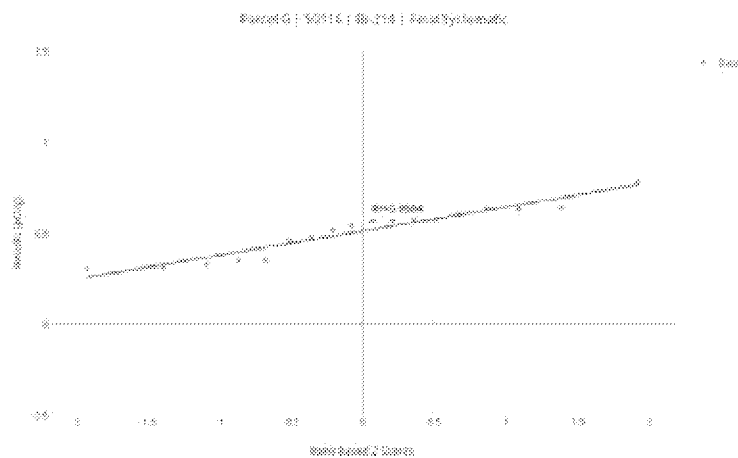


Parcel G | S0116 | Ac-228 | Characterization



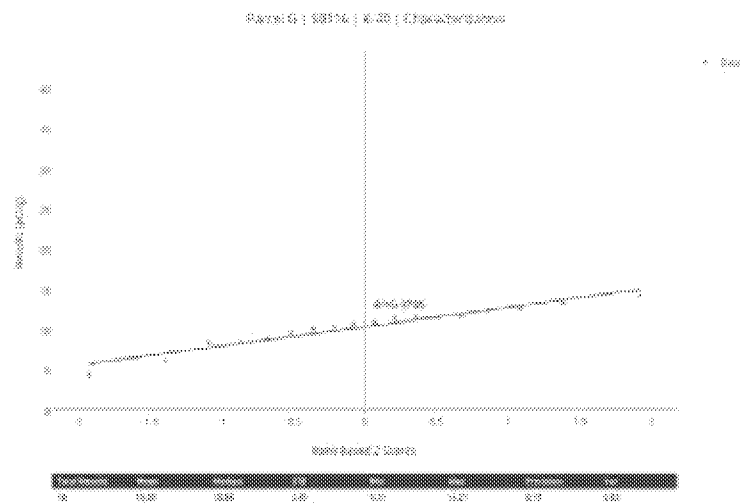
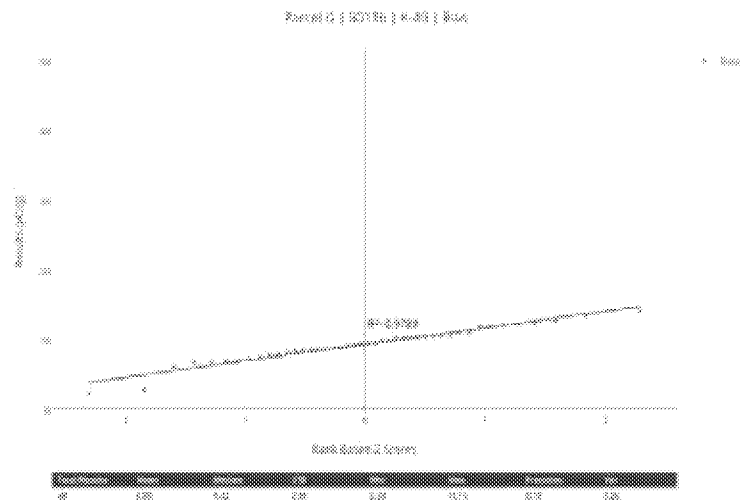
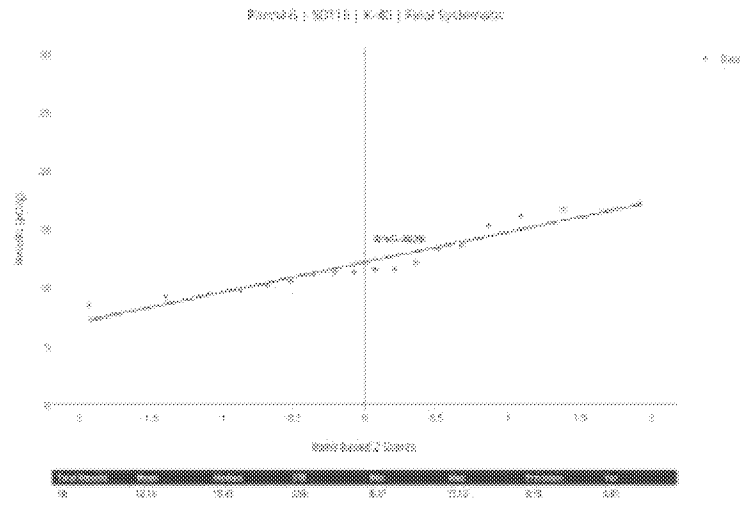
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